Forest Health Protection
Pacific Southwest Region

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To: Sheri Smith, Regional Entomologist, Pacific Southwest Region USFS

Subject: Trip report following initial site visit to Big Valley Rancheria (Pomo Tribe) to determine suitability for FHP funding (FHP Report No. N13-06)

At the request of Sarah Ryan, Environmental Director (Big Valley Rancheria Band of Pomo Indians), a site visit was made to the Big Valley Rancheria near Lakeport, California on September 24, 2013. The objectives were to assess the current stand conditions for potential funding through the Forest Health Protection (FHP) Western Bark Beetle Initiative. Sarah Ryan, John Gichuki (Big Valley Rancheria Band of Pomo Indians), Pete Angwin, and Cynthia Snyder (FHP) were present.

Background

The Big Valley Rancheria is a federally recognized tribe with approximately 171 acres of land located in Lake County California. The tribe has approximately 696 members with about 225 of those currently living on the tribe's reservation lands (Big Valley Rancheria Tribal Court from © 2013 Judicial Council of California / Administrative Office of the Courts (accessed Sept. 25, 2013)).

The purpose of the visit was to look at forested land owned by the Tribe (Figure 1) and discuss insect and disease issues currently facing the Tribe. The issues of main concern were leafy mistletoe in oak and stem galls on willow, both of which were thought to be affecting traditional uses (mast production and basket weaving) of the species at Long Tule Point (Figure 1-C) and

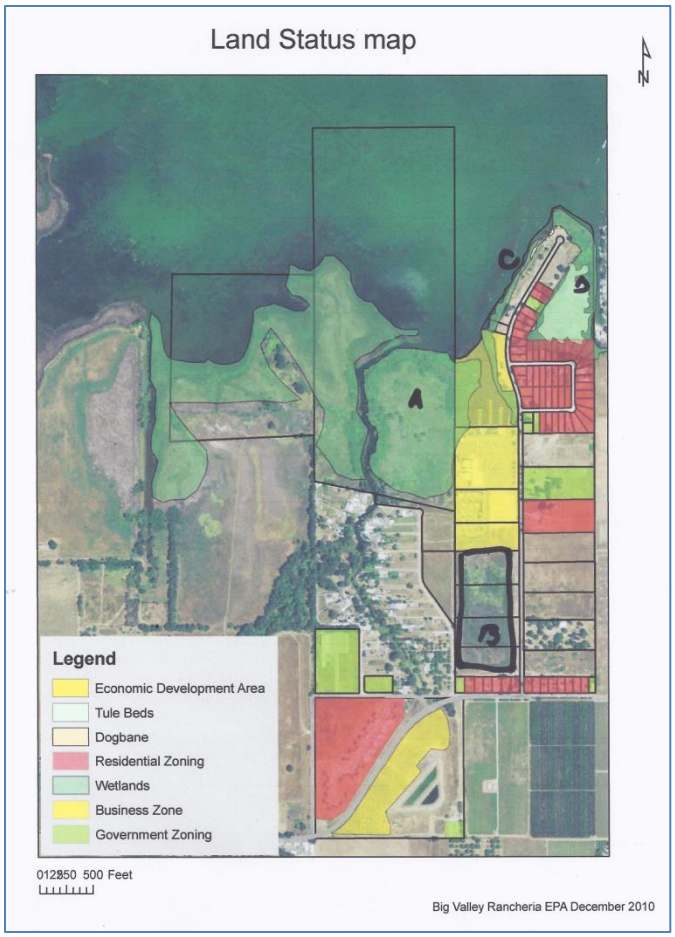

Figure 1. Big Valley Rancheria Tribal land holdings in A, B, C and D.

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assessing the general health of the new willow plantations that were to provide erosion control as well as future ecological and cultural benefits to the Tribe (Figure 1-B). The Tribe was also interested in resources to identify and manage Sudden Oak Death.

Observations

The first stop was to Long Tule Point (Figure 1 – C; N 39.02663°, W 122.88628°, elevation 1,293 ft). This is a 3 acre lakeside park and cultural area with a mix of oak, cottonwood, willow and ash species (Figure 2). The Tribe uses the Point as a gathering place for community events such as the Annual Traditional Tule Boat Festival (started in 2001), and gathering tule and willow for traditional basket making and private parties and picnics. In the past 80 years, there has also been land clearing and firewood cutting in the area.

Figure 2. Long Tule Point Park and cultural site on the south shore of Clear Lake.

At the northern end of Long Tule Point, we found big-leaf mistletoe (*Phoradendron macrophyllum*) in cottonwood (*Populus* spp.), willow (*Salix* spp.) and ash (*Fraxinus* spp.) (Figure 3 and 4). We did not find oak mistletoe (*P. villosum*) on any of the oaks along the point. The big-leaf mistletoe was first noted approximately 5 years ago and has increased dramatically according to Sarah Ryan and John Gichuki. The stem swellings created by the plant indicate that it has been present for a much longer time and it is unknown why it may have increased in prevalence lately. Pete suggested that control of leafy mistletoe

was usually unwarranted because it rarely causes mortality unless the host trees come under severe drought stress. However, in the case of such a high-value site, pruning mistletoe-infected branches from infected trees to a distance of 1 foot from the mistletoe plant may help control the problem on smaller trees as they become infected. Most of the larger trees that were examined were unsuitable for pruning because the severity of infection is so great that nearly all branches would have to be removed to effectively sanitize the tree. Likewise, simply removing the mistletoe plants from the host trees would only provide temporary relief from water stress, until the mistletoe plants grow back out from the infected branches. Overall, the best course of action is to monitor these larger trees and remove them as mortality occurs.

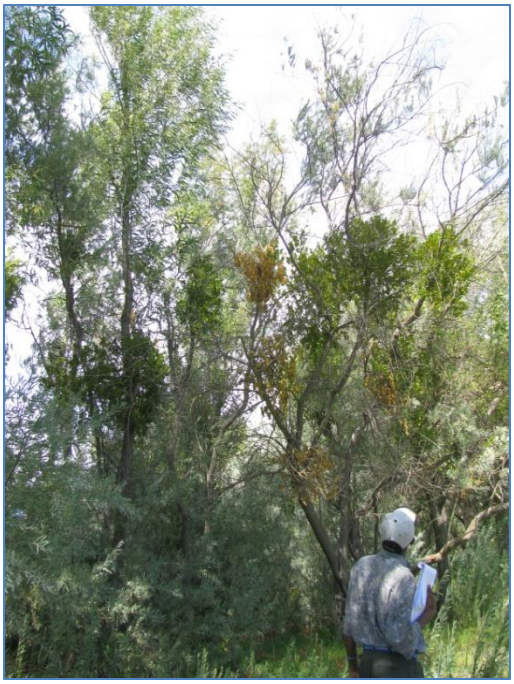

Figure 3. Big-leaf mistletoe in cottonwood and willow.

Figure 4. Branch swelling caused by big-leaf mistletoe in willow.

We also noticed a variety of gall formations on the willow and oak in Long Tule Point (Figures 5, 6, 7 and 8). Most galls, especially foliar galls, cause little or no lasting damage to the hosts. However, many galls may cause limited leaf or twig dieback by blocking the vascular tissue.

Insect galls are tremendously diverse and common in California hardwoods. There are over 30 species of willow (*Salix* spp.) in California and the number of gall-forming insects is unknown but thought to be confined to several sawflies, midges and mites. Along Long Tule Point, we noticed at least three different gall formations including rosette bud galls most likely caused by the willow rosette gall midge (*Rabdophaga salicisbrassicoides*), small red leaf galls and larger green leaf galls with brown wart-like scales. The only noted gall inducer with scales like these is the willow apple gall sawfly (*Pontanica californica*), though I believe that these galls are so dissimilar that they may be caused by different species. It is, however, unlikely that these galls are harming the

trees in any significant way. No stem galls were found at the north end of the point other than the swellings caused by the mistletoe.

On oak there are over 100 species of gall forming insects in about 20 genera. Oak apple galls were noticed in the crown of the valley oaks (*Quercus lobata*) along the point. Oak apple galls on valley oak are formed by the cynipid wasp species *Andricus californicus*. Also found on the oaks were a variety of leaf galls resembling yellow wig gall wasp (*A. fullawayi*) and urchin gall wasp (*Antron echinus*). None of these are known to cause permanent damage to the host. Bud galls were also found on the valley oak, but not easily identified. It was noticed that something may have killed the terminal buds early in the

Figure 5, 6 and 7. Bud and leaf galls on willow.

Figure 8. Bud and leaf galls on valley oak.

Figure 9. Pom-poms of lateral twig growth on valley oak.

growing season, inducing the laterals to grow our more than normal. This resulted in the formation of "pom-poms" of dense growth at the branch ends (Figure 9). Cynipid wasps may have caused this, but it is also very possible that this is just the result of a hard freeze when the terminal buds were developing.

On the southern end of the point, a small stand of willow along the lakeshore had a dense proliferation of stem galls (Figure 10). These were first noticed this year and clearly interfere with basket weaving. These galls ranged from 20 to around 70 mm in length, were bright red turning brown with stem aging. These galls were most likely caused by willow stem sawfly (*Euura exiguae*).

Figure 10. Willow stem galls.

The stated desired condition of the stand was a healthy mix of mature and younger hardwoods, especially oak and willow. The Tribe began coppicing the willow stands at the southern end of Long Tule Point to get better cuttings for basket making. This coppicing was done in late April when the willow stem sawfly would have been emerging as adults. This species generally lives for about 2 weeks as an adult to lay eggs and produce the next generation. Since the stand was coppiced at the time of emergence, no suitable host material was present at the site and the adults would have had to move to the next available willow stand. This would have concentrated the population to a smaller habitat leading to the belief that there was an explosion in numbers.

It was suggested that the coppicing would be a fine control method if done in the fall when the insects are in the larval stage inside the galls. Removing the galls while the insects were inside and either burning the material or otherwise disposing of it off-site would result in much lower populations of galls in the new stands.

We next stopped at a berm created from the material collected when the lakeshore area was dredged in 2004 (Figure 1-B). The berm was planted to willow and appears to have none of the issues facing the park land on the point. There were no indications of current gall insect activity in the stand and no evidence of leafy mistletoe. This may have been due to the age and construction of the stand. Perhaps not enough time had passed for the bird-disseminated mistletoe seed to be deposited and develop into mature plants. In any case, the trees in this area should be closely monitored for the appearance of leafy mistletoe, so that timely branch pruning or whole tree removal may be considered.

Sudden oak death, caused by the water mold pathogen *Phytophthora ramorum*, is a concern of the tribe. Because the pathogen has been identified in Lake County, *P. ramorum* regulations are in effect, which restrict the movement of host materials from the county. *P. ramorum* affects well over 100 plant species, but typically only kills tanoak and members of the red oak family, such as California black oak, coast live oak, canyon live oak and Shreve's oak. Valley oak, which was the most common oak species that was seen during the site visit, is not a host. Vegetation inventory records should be checked to better determine the number and distribution of potential sudden oak death hosts on the reservation, and if this data are lacking, it would be helpful to perform such an inventory. In addition, it would be helpful for tribal members and resource managers to obtain education on the recognition and management of Sudden Oak Death. Much of this information is is available through the California Oak Mortality Task Force and on their web page at www.suddenoakdeath.org. In addition, the task force and UC Cooperative Extension can provide education/training sessions on request. One particular resource that the tribe may want to access is through the "SOD Blitz" program at UC

Berkeley, in which University SOD specialists provide information on the symptoms of Sudden Oak Death and train members of the public in how to sample trees for the disease and send them in for diagnosis. Additional information on the SOD Blitz program is at http://nature.berkeley.edu/garbelotto/english/sodblitz.php

In addition to this, funding for sudden oak death management projects is available through a program that is managed by our Forest Service Forest Health Protection group. The annual request for project proposals usually comes out in December, with a due date in February. Additional information on the program is available from our Forest Health Protection Regional Pathologist, Phil Cannon, at pcannon@fs.fed.us (707-562-9054). In the past, the Kashaya Band of the Pomo Indians has applied for management/monitoring project funds through this program.

Discussion

The Big Valley Rancheria called with three main concerns: galls on willow and oak trees, leafy mistletoe and Sudden Oak Death. The Rancheria has an urban forest with localized infestations of big-leaf mistletoe and gall insects along Long Tule Point. The importance of the willow to the Tribe was made clear and their adoption of coppicing to get better willow growth was a great start at developing and maintaining the desired conditions for the forest. Coppicing should be done in the fall to reduce the gall insect population and provide healthier willows for better cultural products. The other various leaf and bud gall species are a curiosity at this point in time, but are not causing permanent harm to the species affected. Leafy mistletoe on cottonwood and the other park trees can be managed through careful pruning of plants from small diameter trees and monitoring and removal of larger diameter trees as mortality occurs. Sudden Oak Death is not currently a concern for the Rancheria, but contacts can be made to provide training on disease recognition and measures to control spread.

If you have any questions regarding this report and/or need additional information, please contact Cynthia Snyder at 530-226-2437 or Pete Angwin at 530-226-2436.
/s/ Cynthia Snyder

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CC: Sarah Ryan, John Gichuki. Gerald Jones, Chris Fischer, Sherry Reckler, Sheri Smith, and Phil Cannon